



Metro

Metropolitan Transportation Authority

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**EXECUTIVE MANAGEMENT AND AUDIT COMMITTEE
OPERATIONS COMMITTEE
NOVEMBER 16, 2006**

SUBJECT: METRO RED LINE GATING

**ACTION: RECEIVE AND FILE OPTIONS FOR METRO RAIL GATING AND DISTANCE
BASED FARES**

RECOMMENDATION

Receive and file options for Board to consider engaging a fare collection expert to conduct an assessment for gating Metro Rail and implementing distance based fares.

ISSUE

Staff responded to Director Yvonne Burke's motion on Metro Red Line Gating on May 18, 2006 at the Executive Management and Audit Committee (EMAC), informing the Board that staff would issue a "Request for Information" (RFI) in June 2006 to the fare gating community to seek their ideas for installing barrier gates on the Metro Red Line.

The RFI was developed by Metro Procurement with input by Universal Fare System (UFS) staff (see Attachment D). Unfortunately, only two vendor responses were received. Other vendors who were contacted by Metro declined to respond without more technical details, particularly in the absence of an actual contract award. The comparative matrix of the RFI responses from the industry is summarized in Attachment A. Essentially, vendors expressed a need for further analysis to better determine appropriate quantities and types of gates. Such expertise would provide modeling and guidance regarding specific traffic flows and patterns based on ridership data to manage patron queuing. Both vendors also expressed need for clarity on fare policies and business rules to accommodate "cash only" riders, visitors and discretionary patrons who may not carry smart cards for entry and exit through barrier gates. Similarly, the absence of specific direction dealing with the Metrolink "cash" or discretionary passenger was also noted. The quantity and types of gates to accommodate peak loads converging at Union Station for patrons transferring from multiple Metrolink lines to the Metro Red Line was also raised as needing further clarification. Vendors also expressed that an analysis is required on several Metro Red Line stations presenting challenges with connecting stations to Blue Line and Orange Line, or with dissimilar multiple station openings, including the future Exposition Line interface at 7th/Metro station.

An exceptional note which the Board may consider is a "sole source" option to the incumbent supplier, whereby Metro would defer to Cubic Transportation Systems engineers to configure the architecture and determine quantities and types of gates needed. This alternative could reduce or eliminate the level of effort by an independent third party expert or consulting firm.

This approach potentially diminishes assessment costs; however, other trade-offs are discussed below, under “Pricing Analysis”.

Pricing Analysis

While it was the intent of the RFI to obtain a rough order of magnitude (ROM) cost from as broad a cross section of the community as possible to gate, operate and maintain such gates for the Metro Red Line, the respondents to the RFI lacked technically detailed specifications. Defining technical interfaces to Metro’s current legacy system is essential to obtain a valid engineer’s estimate, especially if “open architecture” to permit competition for a non-incumbent, non-Cubic supplier is intended. Pricing is significantly affected depending upon such an approach, as multiple proprietary systems would need to be interfaced.

Due to such challenges, peer transit agencies have historically procured “end to end” solutions with one supplier, avoiding complicated “Intellectual Property” negotiations in this fiercely competitive industry. Moreover, the added level of effort required to ensure compatibility of differing operating systems and devices has presented challenges to achieve “openness” as transit agencies seek to further unlock the market. Recent efforts by industry associations have seen progress in the development of “standards”.

The option for a Cubic “sole source” is therefore a valid alternative to avoid significant engineering and capital costs to interface to other proprietary systems. Rather than to “compete” this procurement which may potentially present more risk and higher costs to Metro, it is possible that other precedence and justification for a “sole source” option exists in the public transit industry. Efficiencies with ongoing maintenance could also be simplified by going to the current incumbent supplier. A decision for either alternative, to “sole source” or to competitively bid for gates, should be made on the basis of a 10 to 15 year lifecycle of this capital investment which is standard in the industry.

The additional cost of station attendants could not be factored by the respondents, and must be incorporated in a complete cost analysis. Such station attendants, both in numbers of staff and hours of operation are determined by the types of gates deployed. Totally unmanned gates in the public transit industry do not exist. Human interfaces and intervention is a pre-requisite even in the most “automated” of fare systems to preserve customer service and to address emergencies and security issues.

The absence of technical exactness and direction made responsible pricing difficult. Staff has attempted to capture a “range” of costs based on limited response to the RFI, using existing industry experiences or standards. This is presented below noting that these prices are not “quotes” from the RFI respondents. Detailed pricing requires an engineering analysis and a formal Request for Proposal (RFP).

Preliminary Cost/Benefit Analysis

Assumptions on “pay back period” are based on a one-time capital investment. Included in the capital costs are estimated expenditures for the construction of station attendant booths, additional station infrastructures and civil engineering. No inflation or other escalation costs are included in these broad estimates made without technical specifications. A general

survey of the industry captured an average capital cost of approximately \$1 to \$1.5 million/station for gated rail systems.

Metro Red Line Revenue Assumptions		
Metro Red Line ONLY Annual Estimated Revenue (FY07 Budget)	\$23.0 M	
Cost of Metro Red Line ONLY Security (FY07 Budget)		\$17.0 M
<i>Note: \$2 M of \$17 M is spent for Fare Inspection</i>		

The intent of gating Metro Red Line is to eliminate fare evasion and promote public safety. 5% fare evasion rate is used for assumption purposes.

Assumption: Eliminate all fare evasion on Red Line by installing Barrier Gates		
Assume elimination of all Fare Inspectors on Metro Red Line (FY07 Budget)		\$2.0 M
Assume entire 5% fare evasion on Metro Red Line is completely eliminated*		\$1.1 M
Potential annual "savings" from Metro Red Line Gates		\$3.1 M

*Note: 5% evasion rate is based on a systemwide survey of 2002. Metro Red Line rate is lower (~3%)

The following is based on available industry experience, history or standard. This is NOT an Engineers Estimate.

CAPITAL Costs - Low/High Ranges of Cost to Gate Metro Red Line		
	Low	High
One Time CAPITAL COST – Low/High Ranges to Gate Metro Red Line ONLY (includes all station infrastructures and civil engineering estimates based on industry experience)	\$50 M	\$150 M
Total One Time Capital Cost:	\$50 M	\$150 M

Note: Based on staff estimates from industry experience in absence of equipment specifications – not a quote by vendors

Recurring Annual Costs		
	Low	High
Annual MAINTENANCE COST – Recurring Cost to maintain NEW Red Line gating equipment Based on annual recurring maintenance costs.	\$5 M	\$15 M
Annual OPERATIONAL COSTS – Recurring throw-away Fare Media for the cash, non-TAP rider who must get through gates based on Limited Use Paper Smart	\$6.5 M	\$8.0 M
Annual OPERATIONAL COSTS – Recurring supplies and materials, telecommunications costs (phone service, network access, videos, etc.); facilities maintenance; etc. Based on annual recurring maintenance costs.	\$3 M	\$5 M
Annual STATION AGENT COST – Recurring Cost for station attendants to "man" Red Line stations (54 station entrances & exits x 3 agents ea x 3 shifts); Supervisors, training, uniforms, etc. (These are not LASD fare inspectors) Based on annual recurring costs.	\$10 M	\$20 M
Total Estimate – Metro RED LINE ONLY	\$24.5 M	\$48 M

Payback Period – Based on CAPITAL COSTS ONLY:

\$50 M divided by \$3.1 Annual “savings” (LOW estimate)	16 years pay back period	
\$150 divided by \$3.1 Annual “savings” (HIGH estimate)		48 years pay back period

ALTERNATIVES TO BARRIER GATES ON METRO RAIL

Barrier gates are commonly used in rail systems around the world to enforce fares, reduce evasion, promote public safety and enhance security. However, another alternative to augment, or replace barrier gates to achieve these similar goals can be done with additional fare inspectors.

Staff consulted the Los Angeles Sheriffs Department Transit Security Bureau to explore options to full barrier gates that accomplished both improved fare enforcement and increased public safety but avoided the capital and recurring operational costs. A potential option which is presented for discussion can be implemented system wide, and is not limited to Metro’s subway lines.

A viable alternative to physical barriers is the consideration of increasing station fare inspectors who can be permanently assigned to each station entrance and exit. Working from kiosks or portable booths these civilian fare inspectors can perform a more comprehensive and systematic approach to fare enforcement than exists today. In contrast to current fare inspection performed by random checks at rail stations and on-board vehicles, these dedicated fare inspectors will be deployed to a specific, assigned station location and serve as a visible and permanent presence at each station. They can monitor patrons entering and exiting the stations and enforce patron fare payment, write citations, query prior offenders lists and assist patrons in trouble or with questions. The visible permanent station kiosk with a regular presence of assigned fare inspectors would serve as a deterrent to fare evasion.

In addition, ancillary “carts” with portable validators can accommodate surges of patrons requiring ingress and egress from stations. Such temporary, mobile arrays of validators can be strategically placed and manned at each station by the fare inspectors and used only during peak periods to assist with “rush”. Otherwise, these portable validation carts and devices are set aside; the existing stationary SAVs serve the public during normal off-peak hours. Such transitional assignments using portable equipment can potentially avoid the cost of permanent barrier gates, yet improve fare enforcement during peak periods when evasion occurs more frequently. The ability to scale personnel to ridership responds to capacity issues on an “as needed” basis and potentially improves patron queuing since “throughput” increases from eliminating the mechanical factors associated with the opening and closing of each individual barrier gate.

The mission of these fare inspectors is to promote voluntary compliance by patrons to pay or validate their rides. The goal is to increase the fare inspection ratio and substantially eliminate fare evasion. Another benefit of this increased “human factor” is to support goodwill and to safeguard the public in the event of an emergency. In a crisis fare inspectors regularly assigned to stations can help evacuate patrons from trains and direct them out of the stations. They serve as “extra pair of eyes” to law enforcement. Carrying radios identical to the deputies, such fare inspectors can assist during threatened or real disasters and help control the public. In addition, these fare inspectors would serve as “ambassadors” for tourists and patrons who are lost or needing assistance.

Late night to pre-dawn hours will likely not require the presence of fare inspectors; at all other times of day, a minimal level of coverage by fare inspectors stationed at kiosks or booths will provide continuous fare enforcement and serve as a constant safety and security presence at all Metro Rail stations.

The one time cost of the portable or permanent kiosks and the recurring cost of the additional fare inspectors are considerably less than the capital requirements and operational costs of barrier gates. The following is a rough order of magnitude cost:

Preliminary Cost-Benefit Analysis Gating ALTERNATIVE

Assumptions on “pay back period” are based on a one-time capital investment that limits expenditures to the acquisition or construction of fare inspectors booths and kiosks and eliminates the fare gating equipment. Also included in the alternative capital costs are estimated expenditures for mobile temporary carts outfitted with portable validation devices, and additional station infrastructures and civil engineering. No inflation or other escalation costs are included in the estimates made without technical specifications.

This is NOT an Engineers Estimate.

Alternative CAPITAL Cost -	Low	High
One Time CAPITAL COST – Low/High Ranges for Portable Kiosks, plus movable carts with validators for Metro Red Line ONLY (includes all station infrastructures and civil engineering estimates based on 54 station entrances & exits) NO barrier gates included	\$2.7 M	\$5.4 M
One Time CAPITAL COST- Additional stand alone Validators for Metro Red Line	\$0.5 M	\$1.0 M
Total One-Time Capital	\$3.2 M	\$6.4 M

Note: Staff estimate based on assumptions made on increasing existing equipment; not a quote from vendors.

A “Rough Order Magnitude” (ROM) cost was obtained from the LASD to provide a very preliminary estimate for additional fare inspectors deployed to each of the 54 station entrances and exits and assigned to specific kiosks. It was assumed that depending on deployment assignments, the 2 shifts should cover both the morning and evening peak periods. Off peak periods would be covered by one fare inspector; 2 additional inspectors would augment the peak periods. These ROM costs include all training, administration and benefits, recruitment, equipment and supervision using today’s “per unit” costs. Based on

economies of scale, a deployment in this order of magnitude may offer opportunities to reduce this per unit cost

Alternative ANNUAL Recurring Costs		Low
Annual MAINTENANCE COST – Recurring Cost to maintain station kiosks, mobile carts and portable validators Based on annual recurring maintenance costs.		\$1 M
Annual OPERATIONAL COSTS – Recurring supplies and recurring materials; facilities maintenance; etc. Based on annual recurring maintenance costs.		\$1 M
Annual NEW FARE INSPECTION COSTS- Adds 378 new LASD Fare Inspectors – training, admin & relief included. 3 inspectors x 54 station entrances x 2 shifts		\$24 M
Total Estimate – Metro RED LINE ONLY		\$26 M

Payback Period – Based on CAPITAL COSTS ONLY:		
\$3.2 M divided by \$3.1 Annual “savings” (LOW estimate)	1 year pay back period	
\$6.4 M divided by \$3.1 Annual “savings” (HIGH estimate)		2.1 years pay back period

Comparison of ANNUAL RECURRING COSTS: Barrier Gate to Alternative Increase in Fare Inspection –		
	LOW	HIGH
Annual Recurring Costs – Maintenance and Operational with Barrier Gates	\$24.5 M	\$48 M
Annual Recurring Costs – Maintenance and Operational with Increased Fare Inspection – No barrier gates.	\$24 M	

Due to constant overhead rate, net increase to Metro Sheriff’s total annual Contract (bus, heavy and light rail) is projected to be \$16.1 M

As an alternative to full barrier gating, the additional “human interface” from fare inspectors serve as the first line defense against fare evasion and offers promise for more all-inclusive, far reaching benefits to ensure systemwide security and customer service improvements.

DISCUSSION ON DISTANCE BASED FARES – BUS & RAIL:

Discussion of the implementation of distance based fares is presented in response to a Board Motion by Director John Fasana on February 26, 2006 at the Full Board Meeting requesting an analysis.

Overview

Both domestically and globally, automated equipment for rail and bus systems allow for the enforcement of distance based fares. The easiest solution is to install barrier gates on rail systems that require patrons to insert a fare medium to enter and exist through barriers while deducting fares based on the distance traveled. The issue becomes more challenging when evaluating such physical installations at light rail stations with limited space; however, more strategic placement of validators in “virtual gate” configuration, or installation of alternative non-automated “fencing” and railing that direct patrons to the existing validation devices are also options.

Historically, peer transit agencies have evolved from gating technology which accepted cash and tokens in its most rudimentary form, to magnetic tickets which have been the industry norm for over a decade. In the last 5 years, smart card technology has been introduced in public transit as a more reliable alternative to reduce fraud, and hasten transaction speeds in contrast to paper and coin alternatives, particularly as it relates to patron “through-put” in rail stations that accommodate surges of riders trying to get through barriers. This technology is used in combination with appropriate fare policies and business rules to enforce “distance based” fare collection, which is intended to collect fares based on distance traveled.

Very recently the banking industry has made its foray into the public transit fare collection arena with a pilot program in New York with the introduction of a Mastercard Credit/Debit card being accepted on limited New York MTA subway stations. If distance based fares are implemented with gates, this is another alternative to track for progress, reliability and customer acceptance.

Newer technology also being tested in the public transit arena is “near field communication” technology, commonly referred to as NFC. An electronic chip embedded in cell telephones serve as the medium to allow entry and exit with barrier gates and account for distance based fares. Begun in the Far East, this technology will be seeing its way to North America, and is yet, another alternative to track for progress, reliability and customer acceptance.

Existing Metro Light Rail Stations

Staff explored the opportunity for improved placement and distribution of existing Stand Alone Validators (SAVs) on Metro Blue, Green and Gold Line stations, and has presented a “visual” which superimposes SAVs to existing stations, as seen in Attachment B. Such reorientation and relocation of SAVs could potentially promote improved patron compliance.

Retrofitting Metro light rail stations with additional SAVs for more convenient patron access potentially reduces fare evasion, as validation can no longer be avoided or ignored. Such strategic placements of SAVs would allow regular TAP card holders to easily validate their rides along the path leading to paid areas of the stations, and eliminates the walk to areas adjacent to the ticket vending machines (TVM) where SAVs are currently installed. With the obsolescence of paper fare media, the “virtual gate” installation would help regular TAP riders more conveniently validate their rides, leaving only the cash and occasional riders to interface with the TVMs.

In a “distance based fare” configuration, SAVs combined with bi-directional guides or railing will help direct and separate patrons entering stations and boarding the train, from those who are alighting from vehicles and leaving the stations. SAVs will validate the maximum fare for a given rail line when “tapping on”, and reconcile the distance traveled, as the patron “taps off” when leaving the station.

Fare Policies to Accommodate Rail to Rail; Rail to Bus; and Bus to Rail Transfers

All transfer points need a comprehensive engineering analysis to ensure fare policies can support and capture all required validations when transferring from one rail line to the next. Metro Blue / Red, Gold / Red, Green / Blue, Orange / Red are lines with intersecting transfer points. Station design is a major factor at Metro Red to Metro Blue and potentially, the Exposition Line, at Metro/7th Station, which is an example where rail to rail transfers are encumbered with tiered station platforms making access to SAVs difficult. This is further complicated if barrier gates are installed on the Metro Red Line at this station.

Bus to Rail, and Rail to Bus policies must also be considered when implementing distance based fares. Technology that can calculate fare structures combining both modes (bus and rail) for one aggregated fare that totals the entire distance traveled, versus independent bus and rail fare structures must be thoughtfully considered when implementing distance based fares.

Interagency transfers are another consideration that affects the region. Currently, patrons traveling on a Municipal carrier can transfer to Metro Rail Lines for the price of one “inter-agency transfer”. In a distance based environment, fare policies must consider appropriate fare structures that can accommodate the myriad combination of rider categories (regular, senior, student, etc.) and fare types (period passes, cash purse, etc.) among all UFS/TAP participant agencies, and permit “financial clearing” using smart cards. To enhance “seamlessness” to the region’s riders, distance based fare structures must support and promote ease of travel.

New Metro Rail and “BRT” Construction Projects – Metro Gold Line Eastside Extension (ESE) and Exposition Line (Expo)

Currently, the Pasadena Gold Line Eastside Extension (ESE) is being built with the new “virtual gate” configuration discussed above. Off-board payment is more easily enforced, as patrons holding TAP smart cards prepare for boarding and validates rides due to the more strategic installation of the SAVs leading to the paid areas of the stations.

In recognition of opportunity to implement the alternative “virtual gate” rail validator placement on the Expo Line during the current design phase, Board direction at this juncture would further ease implementation of distance based fares, should such a policy decision follow. As design continues on the Expo Line, Board direction now with appropriate cost and schedule considerations would ensure that this project promotes the same convenience and access for patrons to validation devices, avoiding more costly retrofits to stations after construction has been completed.

As design is reported to be 30% complete a policy decision is crucial for the Exposition Line. Such policy direction will ensure further consistency in designing future Metro Rail projects so that gating requirements are fully defined in advance of the design phase of construction.

Other Rail & BRT Alternatives

In addition to “virtual gate” relocation of the validators on all existing Metro Blue, Green, Gold and Orange Line stations, on-board portable validators placed near all doors of bus or rail vehicles for patrons to “tap off” are also available in the industry. SAVs in “virtual gate” configuration would promote *pre-board* validation and fare deduction, while portable validators at the doors of the vehicles would capture alightings and reconcile deducted fare based on actual distance traveled. This may address the physical challenges on capturing rail-to-rail transfer at certain stations such as Metro/7th. By capturing the “tap off” on the vehicles themselves, the transfer points and placements of validators on difficult stations can potentially be mitigated. One deterrent to this approach is opportunity for fraud if patrons randomly “tap off” on route to their true destination, and short change capturing the actual distance traveled by tapping prematurely.

Metro Rapid & Local Bus System

In bus systems, the enforcement of distance based fares present greater challenges if boardings and alighting occur simultaneously from multiple doors. If patrons boarded through the front door with the bus operator serving as the fare enforcer, patrons would be charged a maximum fare for a given distance with a smart card, and appropriate deductions reconciled to the distance actually traveled when alighting. As local routes during peak periods would present logistical problems, a better alternative may be to consider distance based fares on Rapid lines only. To appropriately enforce bus fare payment, fare inspectors for Rapid lines would carry hand-held validators identical to the rail inspectors’ devices, and conduct random fare checks on all Rapid routes using distance based fare structures. Even this alternative, however, allows evaders to board without fare payment or validation in the absence of a fare inspector.

Off-Board Fare Equipment for BUS Systems

To promote distance based fares on bus corridors such as Metro Rapid, off-board fare equipment could potentially be considered to augment or replace bus fare boxes. Such options would require collaboration with local jurisdictions to construct kiosks or shelters with provisions for telecommunications infrastructure to operate fare equipment on public sidewalks. An example of a very simple, paper-based off-board equipment is depicted in Attachment C being used in London, where buses have no “on-board” fare boxes.

Summary

The discussion points regarding Distance Based Fares presented in this Board report underscore the need for a 3rd party engineering analysis so that all options for alternative fare collection in Los Angeles can be considered and optimized with the investment thus far made with the UFS equipment. To either introduce full barrier gates on light rail stations, or minimally reorienting and relocating existing SAVs to “virtual gate” configuration would

promote ease of use by patrons, potentially reduce fare evasion, and offers prospects for implementing distance based fares.

The most critical element for such consideration is the need for a technical engineering assessment, since the limitation of space at light rail stations present challenges that require engineering expertise, combined with sound fare policy direction to accommodate distance based fare collection. Further, opportunity with the implementation of Metro Connections offers additional possibilities that must be analyzed fully with the help of technical experts and engineers. Off-board payment on bus systems also present challenges and such alternatives require deeper understanding of infrastructure requirements that require collaboration with local jurisdictions.

The opportunity to enhance revenue collection with additional new devices must be balanced with appropriate fare structures and fare policies so that capital assets maximize fare collection, reduce evasion and promote ridership.

NEXT STEPS

Consider detailed Fare Collection Expert's comprehensive analysis to develop independent estimate for all gating and distance based fare alternatives.

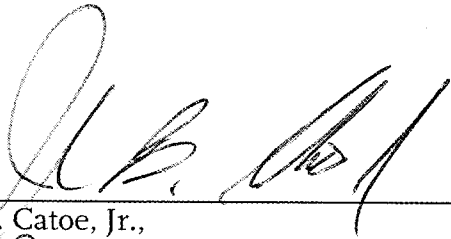
Consider adoption of a policy on distance based fares to optimize the level of effort by the engineering firm selected for the study.

If the Board approves proceeding with the Technical Analysis, staff would prepare a Request for Proposal to compete this analysis by the industry.

ATTACHMENTS

- A. Responses to Metro Red Line Gating RFI
- B. Photos of Light Rail Validator Options
- C. Photo of Off-Board ticket machine in London
- D. Copy of RFI issued to Vendor Community
- E. Director Yvonne B. Burke Motion, Amendment to Item 16, February 23, 2006

Prepared by: Jane Matsumoto, UFS – TAP Project Manager
Alexander Clifford, General Manager, Gateway Cities Service Sector



John B. Catoe, Jr.,
Deputy Chief Executive Officer



Roger Snoble
Chief Executive Officer

**Responses to Metro Red Line Gating
“Request for Information” (RFI)**

The RFI recommended an outline for vendor responses, consisting of 5 Sections, described below:

Section 1 – Conceptual Design		
<p>Briefly describe two or more alternative equipment concepts for gating of Metro Red Line. Describe strengths and weaknesses of each approach and implications, in terms of staffing support, maintenance and through put, to Metro operations. (3-5 pages per concept)</p>		
Vendor 1	Vendor 2	Metro Assessment
<p>Offered combination of fully gated, standard barrier equipment and partial barrier alternatives.</p> <ul style="list-style-type: none"> • Recommended paper smart card as solution for non-TAP or occasional rider • Recommended station agents • Provided ADA considerations • Not included - Civil work and operational costs; however described potential alternative to reduce civil work in Section 2 below. • Not included: cost to retrofit current legacy system 	<p>Offered one standard gate. Stated any alternative approaches would not deter fare evasion and fraud prevention.</p> <ul style="list-style-type: none"> • Requested clarification for business rules on Metro rail to rail, Muni to Metro; Metro to Metrolink and Muni to Metrolink transfers • Suggested magnetic tickets to accommodate Metrolink customer • Recommended engineering review of traffic patterns and flow to handle peak surges • Recommended station agents • Not included: cost to retrofit current legacy system 	<p>Vendor 1 offered several solutions to guide patrons to existing “stand alone validators”, as an option to installing full barrier gates.</p> <p>Both vendors require a separate engineering analysis to establish quantities and types of gates to manage passenger flow, traffic patterns and queuing.</p> <p>Both vendors recognize policies and business rules to accommodate the cash/occasional rider and Metro/Muni/Metrolink transfers</p> <p>Operational/Maintenance Costs not factored by Vendor 2; civil work and construction costs not factored in both.</p>
Section 2 – Feasibility Assessment		
<p>Briefly describe the feasibility of each gating concept in terms of infrastructure requirements and integration into Metro’s existing UFS back office (Cubic’s central computer/Nextfare). Discuss fare media requirements for each gating concept particularly as it relates to the occasional or cash paying customer and patrons transferring from Metro Orange Line or Metrolink. Discuss accommodations for wheel chair or other disabled patrons. (2 page per concept)</p>		

Vendor 1	Vendor 2	Metro Assessment
<p>Systems infrastructure pre-exists; no integration required as the incumbent vendor.</p> <ul style="list-style-type: none"> Fare Media requirements are addressed with current TAP Smart Cards. Limited use, paper smart card for occasional riders, visitors and cash only recommended. Several gate configurations for ADA patrons presented Provided solution to minimize civil work with walkway design options if full barrier gates were installed. 	<p>Established experience with integration to pre-existing legacy systems with other transit agencies.</p> <ul style="list-style-type: none"> Offered (2) options for ADA compliant gates. 	<p>With the exception of the incumbent supplier, any other vendor will need an interface to existing Metro fare systems. While transit agencies can potentially mix different proprietary equipment and systems most have chosen “end-to-end” solutions with their given supplier to avoid costs and technological challenges associated with integrating proprietary systems. “Open architecture” based on new standards and interface specifications are potential options that can be explored to offer a competitive market to multiple suppliers.</p>

Section 3 – Cost and Schedule Estimates

Provide cost estimates for each concept both in terms of capital costs and cost impact to Metro operations. Also, discuss cost drivers, cost tradeoffs, and schedule considerations (2-3 pages)

Vendor 1	Vendor 2	Metro Assessment
<ul style="list-style-type: none"> Expressed need for further clarity on business rules and fare policies to address gate configuration, station configuration, etc. to develop accurate costs Regional costs also need to be factored as Munis will also need to modify their equipment & systems 	<ul style="list-style-type: none"> Expressed need for further clarity and key requirements to address fare structure, gate configuration based on business rules and station configuration, etc. Requires more detailed technical specifications on interface to Metro legacy system. Regional costs also need to be factored as Munis will also need to modify their equipment & systems 	<ul style="list-style-type: none"> Without a technical engineering analysis and a Request for Proposal (RFP) through a procurement process staff cannot obtain a responsive, responsible cost estimate from which to base true capital equipment costs, ancillary construction costs, and recurring operating and maintenance costs. External expertise is required to establish equipment quantities based on a combination of traffic flows, ridership data including, interagency business rules, and technical interfaces between proprietary systems.

Section 4 – Corporate Expertise

Briefly describe your company, your products and services, history, ownership, financial information, and other information you deem relevant. (no suggested page count). In particular, please describe any projects you have been involved in that are similar in concept to what is described in this RFI, including type of gate, operational approach, infrastructure requirements, integration with Cubic fare collection systems and any relevant lessons learned (1 -2 pages per project).

Vendor 1

Provided extensive world wide and domestic experience, background and history in delivering fully automated, electronic fare collection systems including barrier gates.

Vendor 2

Provided extensive world wide and domestic experience, background and history in delivering fully automated, electronic fare collection systems including barrier gates.

Metro Assessment

Multiple suppliers are available to assist Metro install, operate and maintain gates. A comprehensive gating analysis is required to ensure Metro has described in technical detail, the physical and operating requirements to gate Metro Rail.

Section 5 – Additional Materials

Please provide any other materials, suggestions, and discussion you deem appropriate.

Vendor 1

Provided data sheet of suggested standard gate

Vendor 2

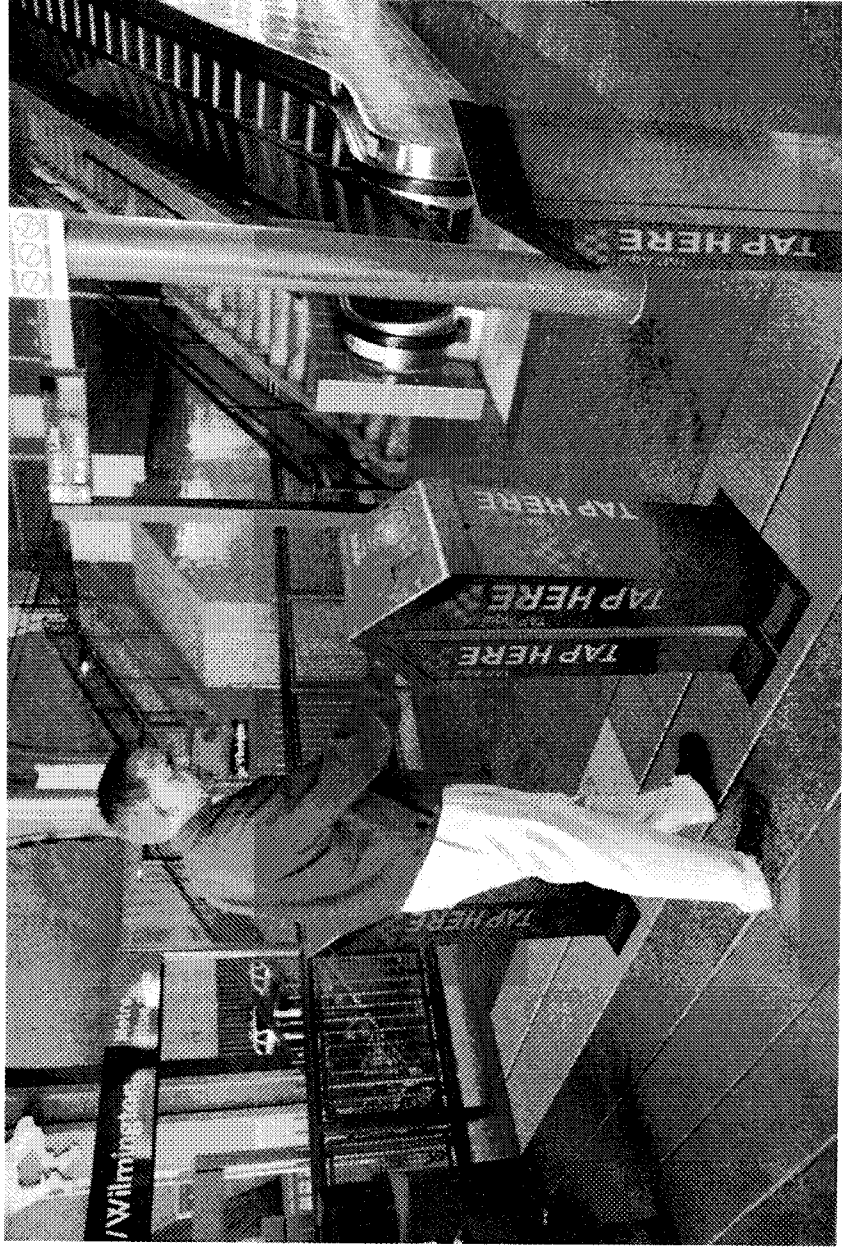
N/A

Metro Assessment

A well defined technical specification is essential.

Color Designations

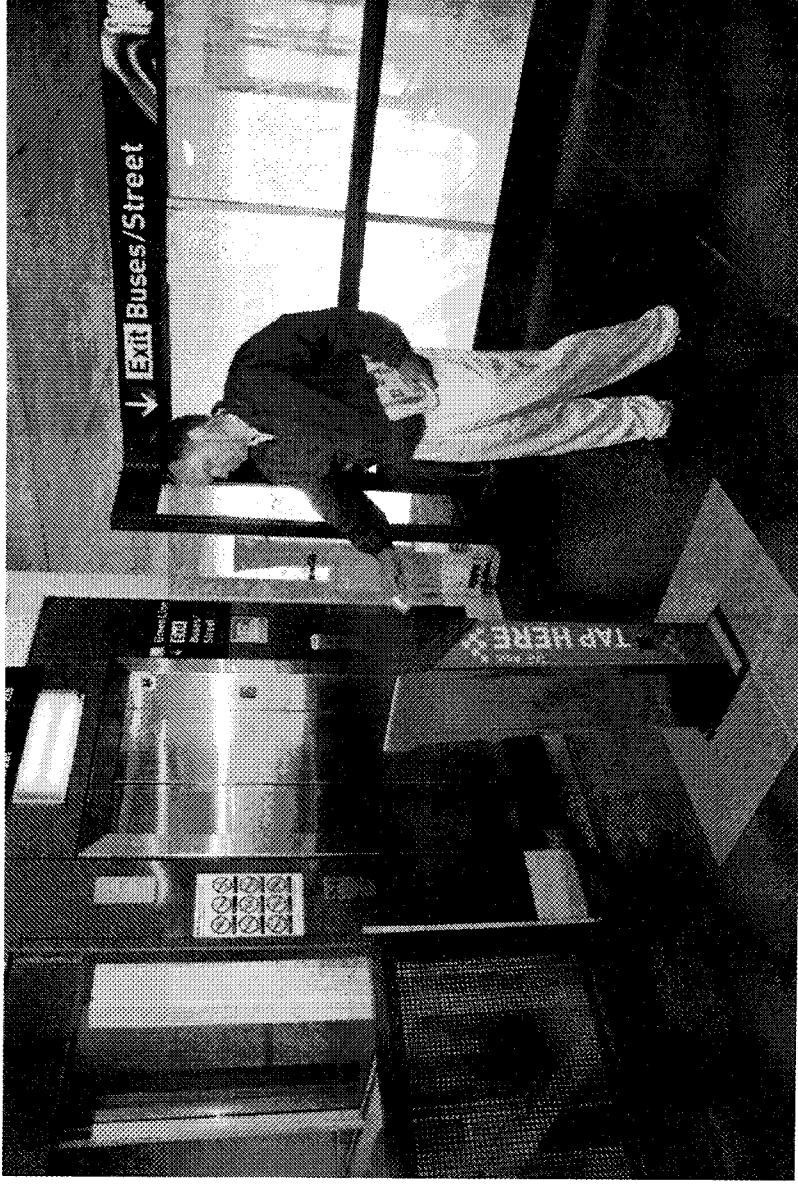
- Proper placement and color designations will make tapping easier



Metro

Meets ADA Requirements

- SAV's at every entrance including elevators ensures ADA compliance



Consistency

- Virtual gates at light rail stations are consistent with Metro Red Line SAV positions



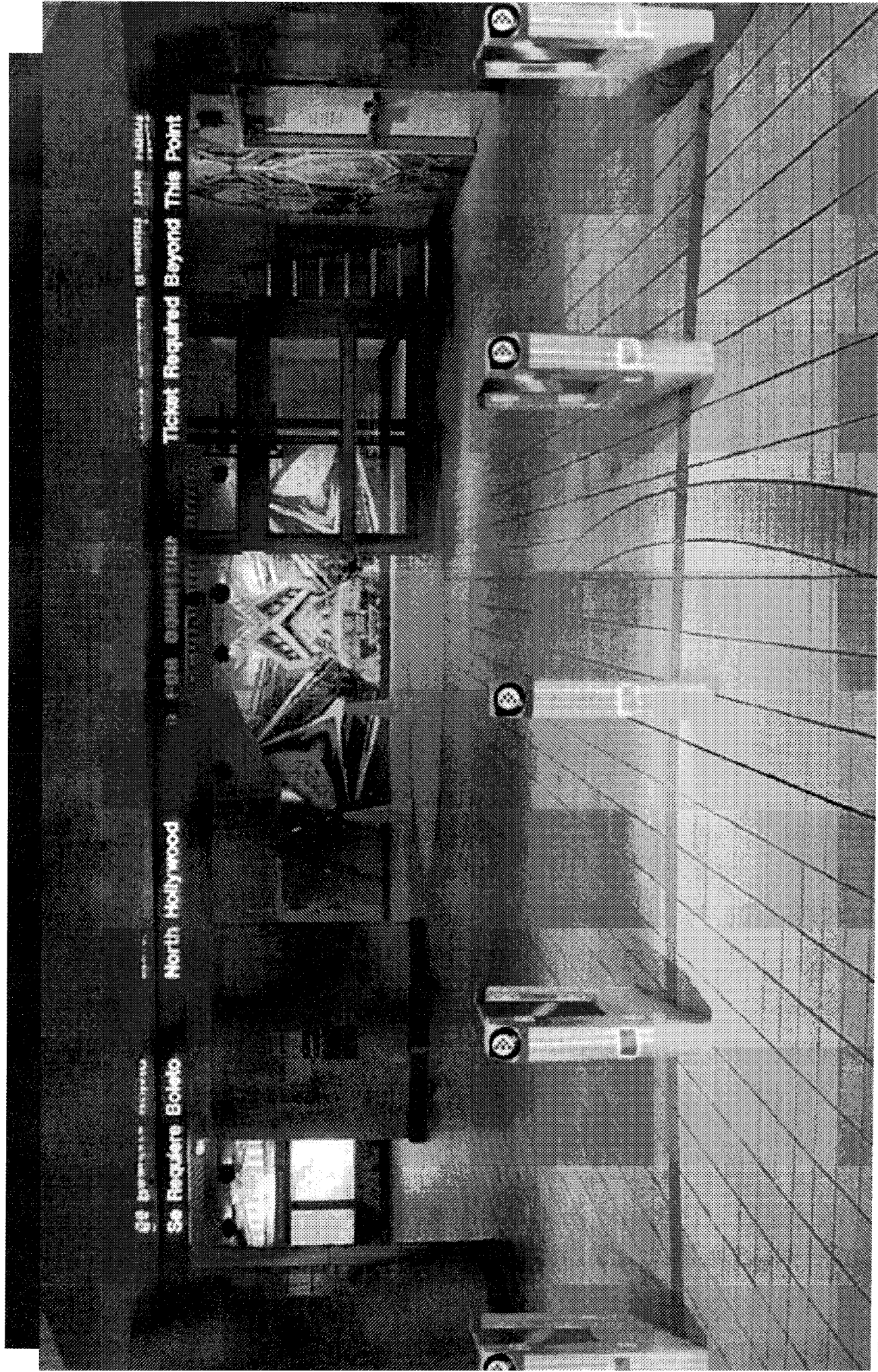
Se Requiere Boleto

North Hollywood

Ticket Required Beyond This Point

Se Requiere Boleto

North Hollywood

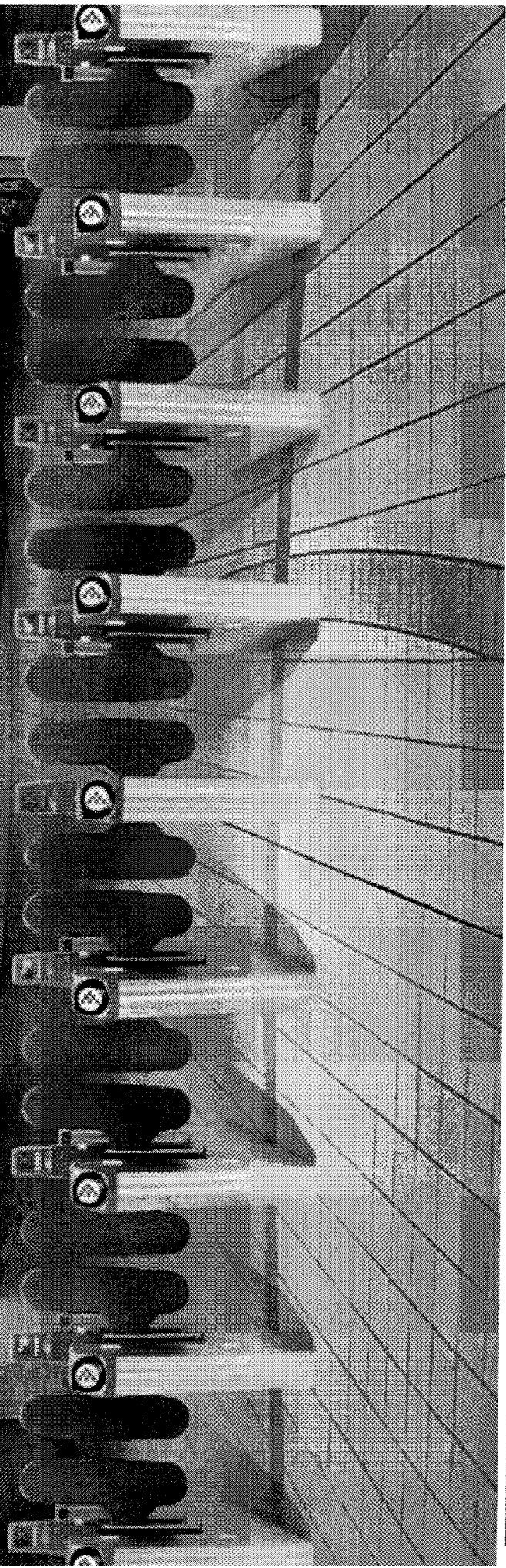


Se Requiere Boquete

North Hollywood

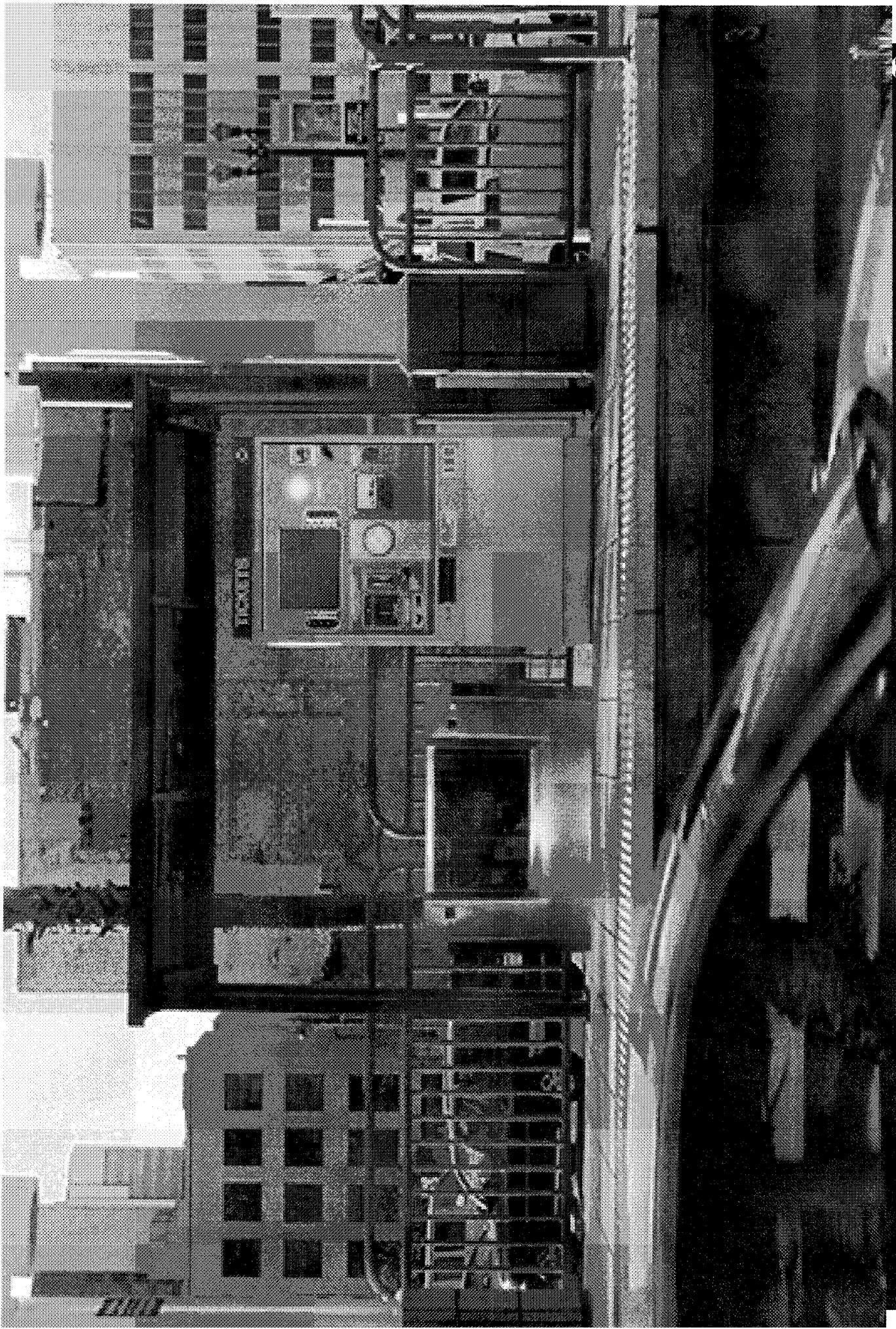
Los Angeles

Ticket Required Beyond This Point











Bank Station DLR
Towards Millennium
or Leeson Street

21	43	133
141	N21	N133

Buy tickets here
before
boarding

ATTACHMENT D

June 1, 2006

Dear Responders,

Subject: Los Angeles County Metropolitan Transportation Authority
RFI, Gating of Metro Red Line Stations

This Request for Information is issued to obtain information and pricing estimates to be used by Metro staff and the MTA Board of Directors in consideration of the potential gating of Metro Red Line Stations (i.e. Subway Stations) in Los Angeles. Metro currently operates Metro Red Line on a "proof of payment" basis with fare enforcement performed by fare checkers at the rail stations. The MTA Board of Directors has expressed an interest in gating Metro Red Line for the purpose of reducing fare evasion and reducing or eliminating the need for contracted fare checkers as described in the RFI below.

If you have any questions regarding this RFI, please contact Don Dwyer by phone, 213-922-6387 or e-mail: dwyerd@metro.net. Thank you for your participation in this request.

Don Dwyer
Contract Administration Manager

REQUEST FOR INFORMATION FOR GATING METRO RED LINE

1.0 SUBJECT

This Request for Information (RFI) is issued for the purpose of soliciting feasibility concepts and ROM pricing for the gating of Metro Red Line Stations

2.0 DESCRIPTION

The Board of Directors for the Los Angeles Metropolitan Transportation Authority (Metro) has expressed interest in exploring the feasibility of gating Metro Red Line Stations for the purpose of reducing fare evasion and minimizing required staff (fare checkers) that currently support Metro's current proof-of-payment system.

Specifically, this RFI seeks the following information:

Metro Red Line Gating:

- Technical feasibility assessment:
 - Gating Equipment
 - Infrastructure Requirements
 - Communication Requirements
- Approximate cost information (i.e., order of magnitude, ballpark estimates, etc.) for each approach
- Schedule estimates for implementation
- Ideas and suggestions for alternative gating approaches:
 - Manned versus Un-manned gating system
 - Gate design, strengths and weaknesses
 - Operational considerations for:
 - Maintenance
 - Access Media
 - Smart Card Holders
 - Non-Smart Card patrons (i.e. cash)
 - Transfers from Metrolink, Metro Orange Line (Bus Rapid Transit)
 - Impact to Station Throughput/queuing
 - Disabled and Wheel Chair Access

3.0 CURRENT SYSTEM DESCRIPTION

Metro Red Line Stations:

STATION	ENTRANCES
Union Station	Two Gate Installation (East Entrance and West Entrance – One across the width of

	the East Mezzanine; one across the width of the West Mezzanine.)
Civic Center	Two Gate Installation (North Entrance and South Entrance – One across the width of the North Mezzanine; one across the width of the South Mezzanine.)
Pershing Square	Two Gate Installation (North Entrance and South Entrance – One across the width of the North Entrance; one across the width of the South Entrance.)
7 th /Metro Center	Four Gate Installation (East and West Entrances – both across the width of the mezzanine; East and West Mezzanine Transfer Areas for Hope St. Entrance and transferring MBL passengers at stairs closest to MBL platform to get to lower Metro Red Line platform.)
Westlake/MacArthur Park	Two Gate Installation (North Entrance and South Entrance – Both across the width of the mezzanine – One for the East half and one for the West half of the common mezzanine to either side of the entrance wall openings.)
Wilshire/Vermont	Two Gate Installation (New Entrance at former Plaza Level – Across the width of the passageway opening to stairs/escalators; Street Level – to serve elevator headhouse.)
Wilshire/Normandie	One Gate Installation (Single entrance – Across the width of a single mezzanine.)
Wilshire/Western	Two Gate Installation (Single Entrance – both across the width of the mezzanine – one for east half and one for west half of common mezzanine to either side of entrance wall opening.)
Vermont/Beverly	One Gate Installation (Single entrance – Across the entrance opening into a single mezzanine.)
Vermont/Santa Monica	Two Gate Installation (North Entrance and South Entrance – One across the width of the entrance opening to the north mezzanine; one across the width of the entrance to the south mezzanine.)
Vermont/Sunset	Two Gate Installation (Rotunda entrance and Kaiser entrance – One across the width of the Rotunda entrance opening to a common mezzanine/ one across the

	width of the Kaiser entrance opening to the common mezzanine.)
Hollywood/Western	One Gate Installation (Single entrance – Across entrance opening to a single mezzanine.)
Hollywood/Vine	One Gate Installation (Single entrance – Across the entrance opening to the single mezzanine.)
Hollywood/Highland	Single Gate Installation (Single Entrance – Across entrance opening to a single mezzanine.)
Universal City	Single Gate Installation (Single entrance – Across entrance opening to single mezzanine.)
North Hollywood	Single Gate Installation (Single entrance – Across entrance opening to a single mezzanine.)

Equipment Provider: Metro’s Universal Fare System of bus fareboxes, rail ticket vending machines, stand alone validators, central computer system and other related equipment is provided by Cubic Transportation Systems, Inc.

Fare Collection: Metro’s current rail fare collection system (UFS) is a smart card based system of Ticket Vending Machines and Stand Alone Validators. Station entrances currently are barrier-free and proof of payment is performed by outsourced fare inspectors who periodically ask patrons to display evidence of payment.

Payment Media: Metro is intending to migrate the majority of their patrons to a smart card system. Patrons will enter the system using a smart card encoded with electronic prepaid pass products or through the use of an electronic purse. Electronic validation of payment and reloading of the card can be made at a Ticket Vending Machine. Validation of payment can also be made at a Stand Alone Validator. Cash paying customers, after paying for their fare, enter the system with a printed ticket. Since a printed ticket will not activate a fare gate, Metro is investigating the possibility of issuing “limited use smart cards” for the cash and occasional customer and eliminating as much as possible printed media.

Although tokens are currently in circulation, distribution and sales will cease with UFS implementation until tokens are eliminated through attrition or discontinued at some future date.

Light Rail Lines (LR): Metro operates several light rail lines, and one dedicated bus way, three of which join the Metro Red Line. The Long Beach Blue Line (LR) joins the Red Line at the 7th/Metro Station. Patrons can exit the Blue Line (LR) at an underground station platform then descend another level to catch a Red Line train without leaving the station itself. Metro Orange Line (dedicated bus way) joins the Red Line at the Red Line North Hollywood station. Patrons transfer between an “at grade” articulated bus and the Red Line subway at the North Hollywood station. The Metro Gold Line (LR) joins the Red Line at Union Station.

Patrons transfer from an “at grade” station on Gold Line to the Red Line subway using either an escalator or elevator in separate areas of Union Station. Similarly, Metrolink trains also have a stop at Union Station adjacent to the Gold Line platforms and their patrons transfer to the Red Line using the same station entrances and exits.

Metro Red Line patrons enter the system with the following media:

1. Paper one-way ticket printed at the TVM
2. Paper Day Pass printed at the TVM
3. Paper Day Pass issued on a Metro Bus and valid on Metro rail
4. Paper Interagency Transfer (IAT) issued by a Municipal Bus Operator and valid on Metro rail
5. Paper Metrolink ticket issued on their TVM valid for Metro rail transfer
6. Paper passes in the form of monthly, semi-monthly, and weekly passes will convert to smart cards. Metrolink pass riders will also have TAP smart cards for transfer purposes to Metro bus and rail and Municipal operators’ bus systems.

Gating of the Light Rail lines is not contemplated with the exception of the entrance to the Red Line from the underground Blue Line station at the Metro/7th Street station.

Interface to Universal Fare System: Device management, fare validation and data collection of installed fare gates shall be controlled through Cubic’s central data collection system (CDCS) computer operating on Cubic’s Nextfare 4 smart card system software.

Metro Red Line Infrastructure: Metro Red Line stations were constructed with provisions for barrier gating. Duct banks containing communication and power are already in place. Currently, an array of Stand Alone Validators has been installed over the duct bank where future fare gates would be positioned.

The purpose of this RFI is to gather information about the requirements enumerated above. To the extent simplifying assumptions are needed, respondents are encouraged to make and document such assumptions in their responses.

4.0 SAMPLE RESPONSE OUTLINE

Following is a suggested outline and suggested page counts for a response to this RFI. This outline is intended to minimize the effort of the respondent and structure the responses for ease of analysis by the government. Nevertheless, respondents are free to develop their response as they see fit.

Section 1 – Conceptual Design

Briefly describe two or more alternative equipment concepts for gating of Metro Red Line. Describe strengths and weaknesses of each approach and implications, in terms of staffing support, maintenance and through put, to Metro operations. (3-5 pages per concept)

Section 2 – Feasibility Assessment

Briefly describe the feasibility of each gating concept in terms of infrastructure requirements and integration into Metro's existing UFS back office (Cubic's central computer/Nextfare). Discuss fare media requirements for each gating concept particularly as it relates to the occasional or cash paying customer and patrons transferring from Metro Orange Line or Metrolink. Discuss accommodations for wheel chair or other disabled patrons. (2 page per concept)

Section 3 – Cost and Schedule Estimates

Provide cost estimates for each concept both in terms of capital costs and cost impact to Metro operations. Also, discuss cost drivers, cost tradeoffs, and schedule considerations (2-3 pages)

Section 4 – Corporate Expertise

Briefly describe your company, your products and services, history, ownership, financial information, and other information you deem relevant. (no suggested page count). In particular, please describe any projects you have been involved in that are similar in concept to what is described in this RFI, including type of gate, operational approach, infrastructure requirements, integration with Cubic fare collection systems and any relevant lessons learned (1 -2 pages per project).

Section 5 – Additional Materials

Please provide any other materials, suggestions, and discussion you deem appropriate.

5.0 DISCLAIMER

This RFI is issued solely for information and planning purposes only and does not constitute a solicitation. All information received in response to this RFI that is marked Proprietary will be handled accordingly. Responses to the RFI will not be returned. Responders are solely responsible for all expenses associated with responding to this RFI.

6.0 CONTACT INFORMATION

Following is the Point of Contact (POC) for this RFI:

Mr. Don Dwyer
(213) 922-6387
dwyerd@metro.net

Please submit questions/responses via e-mail in Microsoft Office format by 4:00 PM on June 30, 2006, to Don Dwyer at: dwyerd@metro.net. You may also submit supplemental hardcopy materials such as brochures, etc. (5 copies each) to the Don Dwyer (99-9-49) c/o Metro, One Gateway Plaza, Los Angeles, CA 90012-2952.

METRO DATA NETWORK

LACMTA currently utilizes a distributed Wide Area Network for fare collection related operations. LACMTA intends to expand this network to incorporate its new Red Line gating opportunities.

The following information is based upon existing LACMTA fare collection specific network configurations anticipated for the Red Line stations.

All Red Line stations will be connected to LACMTA's Rail Operations Center via a dedicated 56Kbps connection to a DS0 Channel Bank.

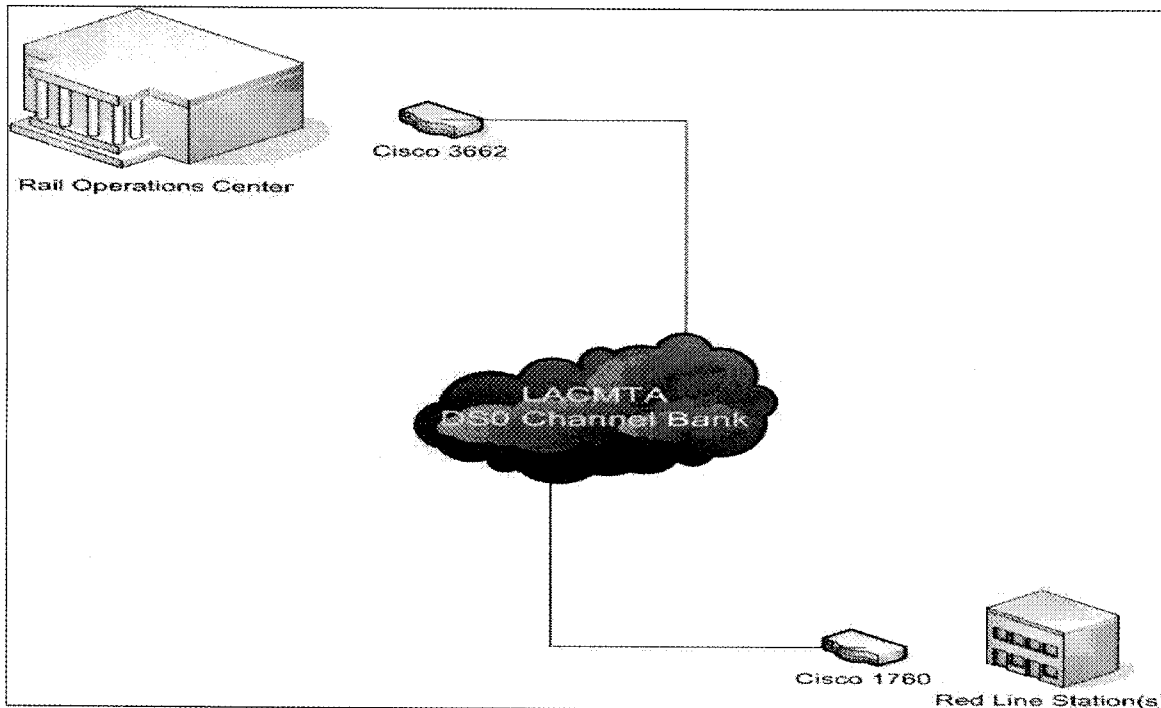


Figure 1 - Conceptual Red Line Network

- Each station will utilize a Cisco 1760 router running DHCP
- This router is connected to a Cisco 2950 switch within each Red Line station
- All communications shall be enabled for wire-speed (T1/E1) encryption
- The application layer shall also utilize a 3DES or similar cryptographic algorithm as prescribed by LACMTA
- Red Line station internal networks shall carry both fare collection related data and non-fare collection data (to be specified during design)
- All network connections and equipment shall be fully redundant
- Data transmission rates and bandwidth requirements will be further discussed and refined during detailed design

Station network design and requirements will be further discussed and refined during detailed design.

Amendment to Item No. 16 by Supervisor Yvonne B. Burke February 23, 2006

As we move forward with the implementation of the smart card Universal Fare System, we need also remedy the problems surrounding the present (non-barrier) passenger ticketing system. I believe it is time for this agency to make the capital investment for a barrier, turnstile ticketing system similar to what every other major transit property uses for their heavy rail "Red Line" systems.

Each year the MTA spends approximately \$19 million dollars on security for the Red Line, and a significant portion of that cost is spent on "fare inspectors" who randomly ask passengers to produce their tickets. It has been estimated that the capital costs of installation of a barrier ticketing system would run in the neighborhood of \$30 million dollars. While the former LACTC decision to employ the "honor system" for a fledgling rail service could be characterized as "laudable, it has proved over the years to be unwieldy, inefficient and extremely costly to rely on "fare inspectors" as a means to prevent fare evasion. It would be reasonable to estimate that the capital investment of a barrier system could be amortized over a period of several years and offset by the ongoing savings from the escalating manpower-costs of using fare inspectors. Furthermore, the barrier system efficiencies greatly enhance the application of the smart card technology.

Additionally, indirectly related to this issue of curtailing fare evasion, is the increasing problem that there is an extremely high incidence of fare evasion scofflaws who fail to pay the citation they receive from the MTA fare inspectors. Such failure to pay results in the Superior Court's issuance of a bench warrant; thereby further exacerbating the drain on existing court resources when the scofflaws are arrested and taken into custody. One example of this systemic problem is the Compton Court in the City of Compton. On any given day, the Compton Courthouse receives an average of 40 arrests just from MTA fare evasion-citation bench warrants. The processing of these warrants and custodies puts a severe strain on the courts, who are otherwise extremely busy processing serious felony cases and criminals. MTA staff are presently engaged in discussions with the Courts examining alternatives to the present system. Many cities have decriminalized the infractions and have established "transit adjudication bureaus" that not only relieve the courts of this burdensome task, but also provide for a greater cost recovery mechanism for the administrative process and security efforts.

I, THEREFORE, MOVE, that this Board instruct the CEO to return to the Board in April at the Executive Management and Operations Committees (respectively) with:

1. Recommendations, including a timeline, on the implementation of a barrier ticketing system for the Red Line;
2. The capital costs of such implementation and potential funding sources;
3. A financial analysis of cost savings that includes a "payback" amortization period of the barrier system as compared with the present escalating manpower-costs associated with using fare inspectors; and
4. A report by staff on the feasibility of MTA sponsored legislation to decriminalize Penal Code Section 640, including recommendations and a financial analysis on the costs of establishing a "transit adjudication bureau" to process fare evasion infractions and the potential for MTA "cost recovery" revenue estimates.

